

Realtek IoT/Arduino Solution

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Ameba Arduino v1.1.3

Ameba Arduino: Getting Started With RTL8195

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Required Environment

目前Ameba支援Windows XP/7/8 32位元/64位元，以及MAC OS作業系統。

並且使用 Arduino IDE 1.6.5 之後的版本。

Introduction to Ameba

Ameba是一張開發板，適合開發各式的感測器或物聯網應用。它上面的介面有Wifi, GPIO, NFC, I2C, UART, SPI, PWM, ADC，這些介面可以接一些電子元件像是LED燈、開關、壓力計、溫濕度感測器、PM2.5粉塵感測器等等。

這些資料可以經由內建的Wifi上傳到雲端，搭配手機的App實現物聯網的實作。

LANGUAGE:

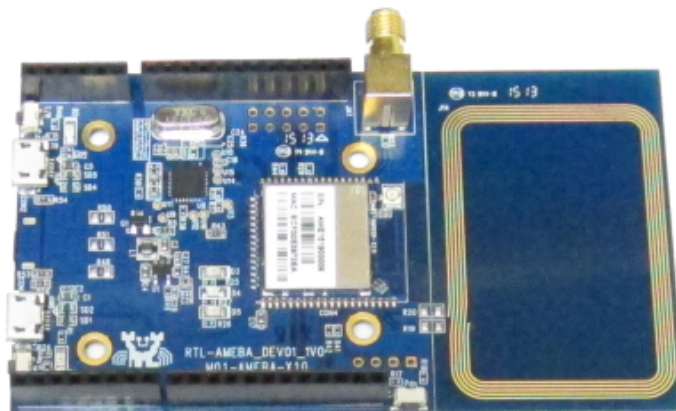
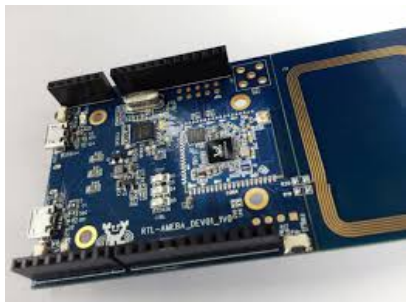
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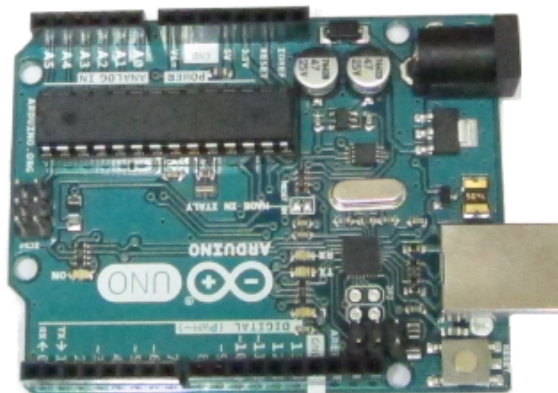
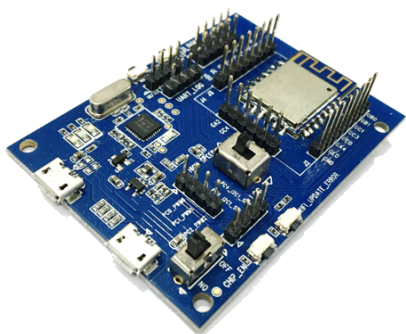
累計點擊: 1,028,943

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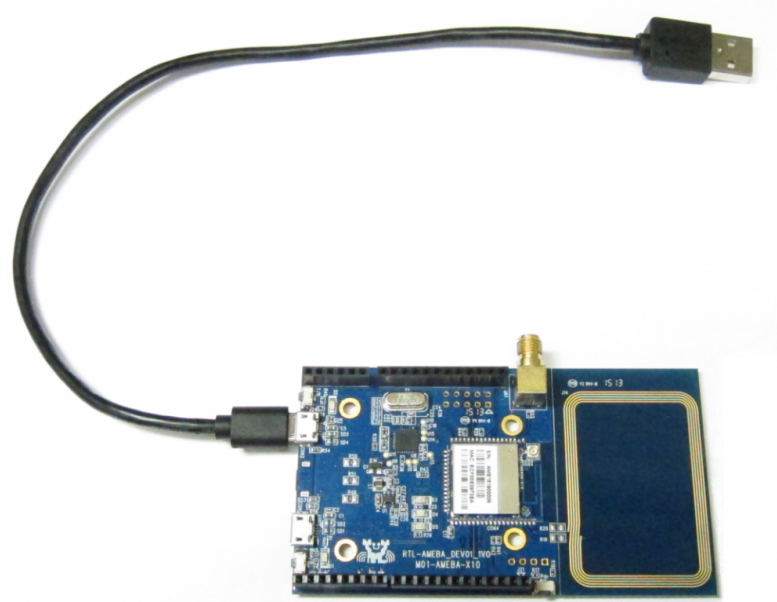
Access permission denied

Ameba與Arduino Uno的大小差不多，圖中上方是Ameba，下方則是Arduino Uno，Ameba的針腳與Arduino Uno相容，Ameba右邊多了NFC天線，如果沒用到NFC天線可以將右邊的板子裁掉。Ameba使用Micro USB供電，一般的手機充電線就可以用在Ameba上。

Setting up Development Environment

Step 1. 安裝Driver

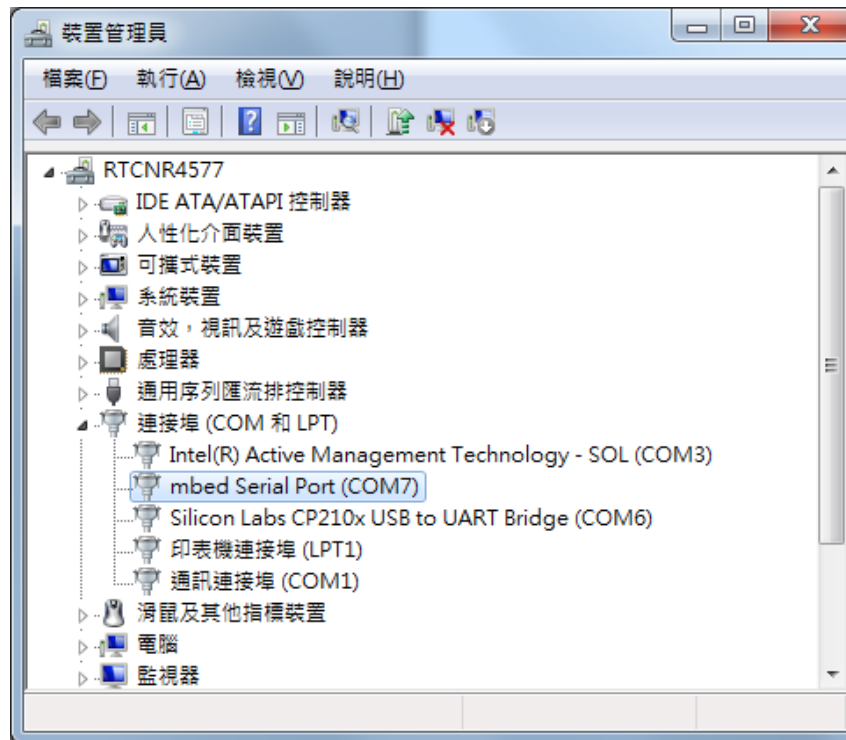
首先將Micro USB接上Ameba，另一端接上電腦:



第一次接上Ameba需要安裝USB驅動程式，Ameba使用標準的ARM MBED CMSIS DAP driver，你可以在這個地方找到安裝檔及相關說明:

<https://developer.mbed.org/handbook/Windows-serial-configuration>

在 "Download latest driver" 下載
"mbedWinSerial_16466.exe" 並安裝之後，會在裝置管理員看到mbed serial port:

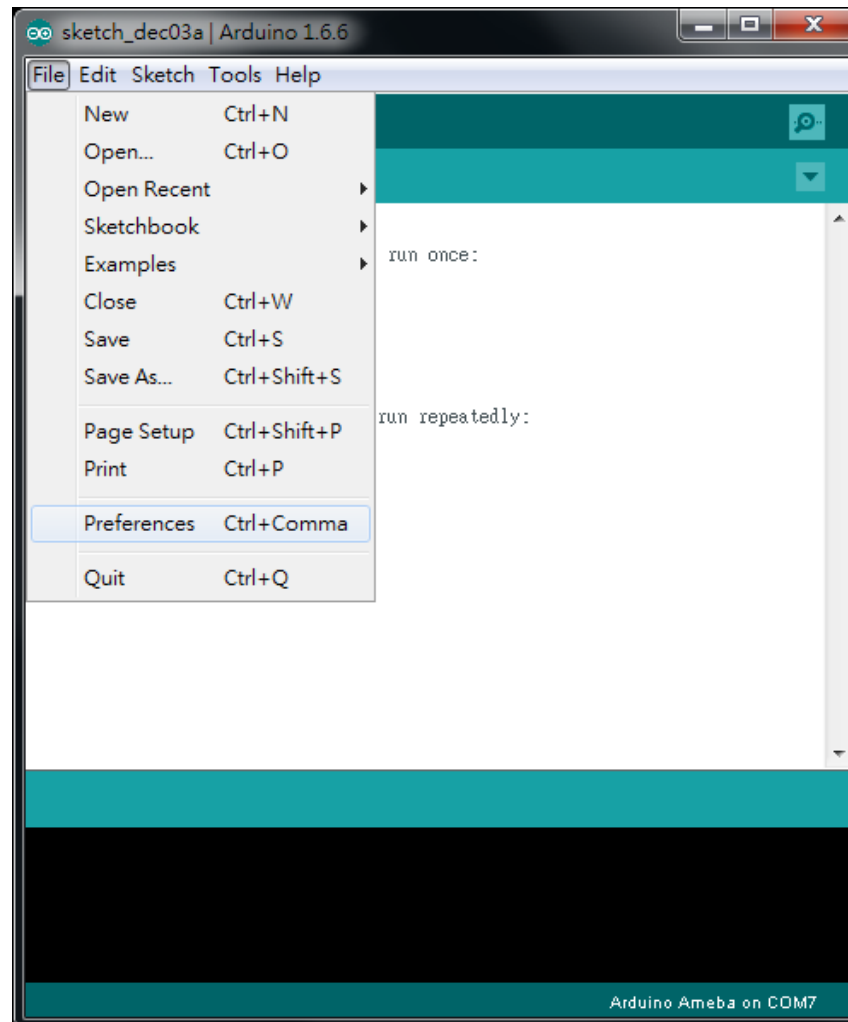


Step 2. 安裝Arduino IDE開發環境

Arduino IDE在1.6.5版之後，支援第三方的硬體，因此我們可以在Arduino IDE上開發Ameba，並共享Arduino上面的範例程式。在Arduino官方網站上可以找到下載程式：

<https://www.arduino.cc/en/Main/Software>

安裝完之後，打開Arduino IDE，為了讓Arduino IDE找到Ameba的設定檔，先到“File” -> “Preferences”

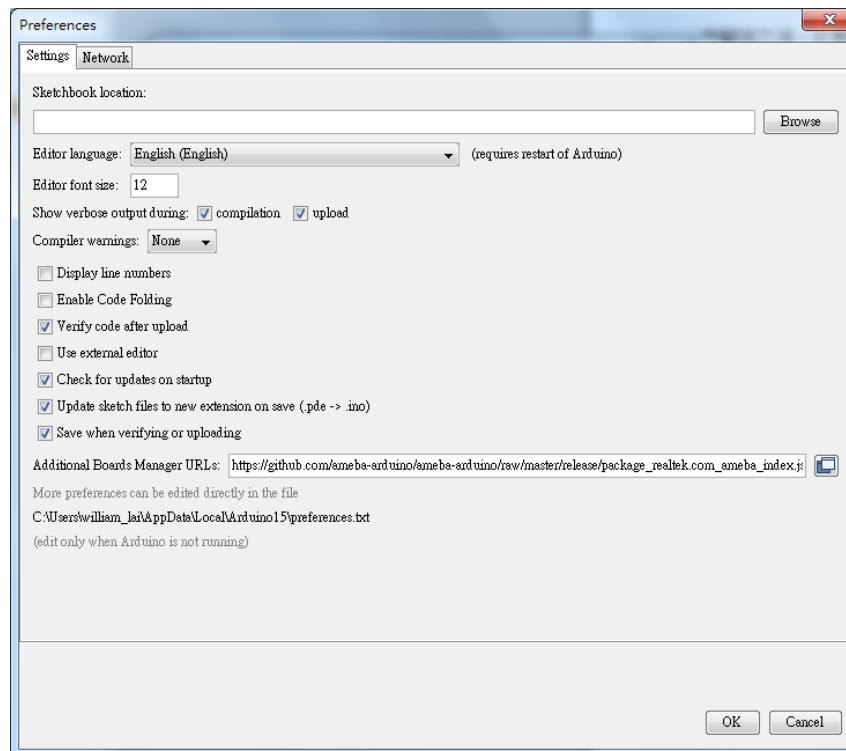


然後在 Additional Boards Manager URLs: 填入：

```
https://github.com/Ameba8195/Arduino/raw/master/release/package_realtek.com_ameba_index.json
```

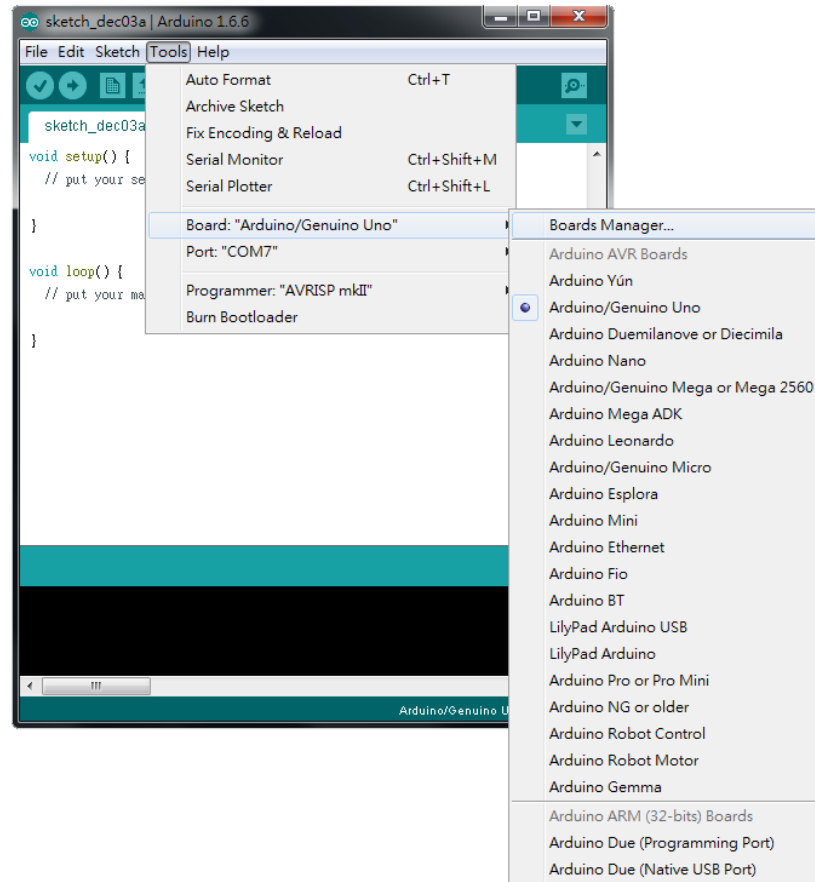
Arduino IDE 1.6.7以前的版本在中文環境下會有問題，若您使用1.6.7前的版本請將“編輯器語言”從“中文(台

灣)”改成 English。在Arduino IDE 1.6.7版後語系的問題已解決。



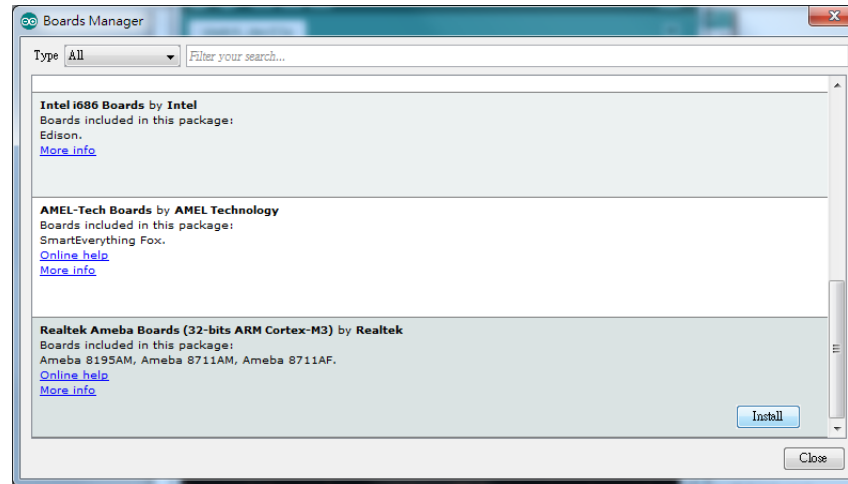
填完之後按OK，然後因為改編輯器語言的關係，我們將Arduino IDE關掉之後重開。

接著準備選板子，到“Tools” -> “Board” -> “Boards Manager”

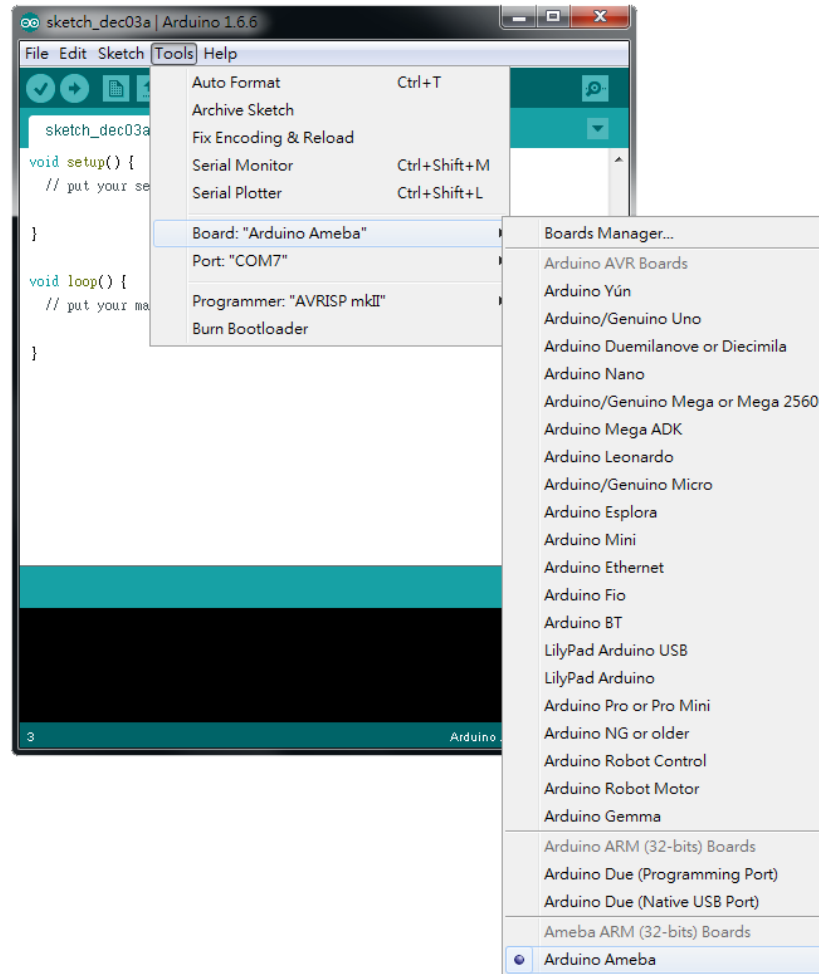


在“Boards Manager”裡，它需要約十幾秒鐘整理所有硬體檔案，如果網路狀況不好可能會等上數分鐘。每當有新的硬體設定，我們需要重開“Boards Manager”，所以我們等一會兒之後，關掉“Boards Manager”，然後再打開它，將捲軸往下拉找到“Realtek Ameba Boards”，點右邊的Install，這時候

Arduino IDE就根據Ameba的設定檔開始下載Ameba所需要的檔案：



接著將板子選成Ameba，選取“tools” -> “Board” -> “Arduino Ameba”：



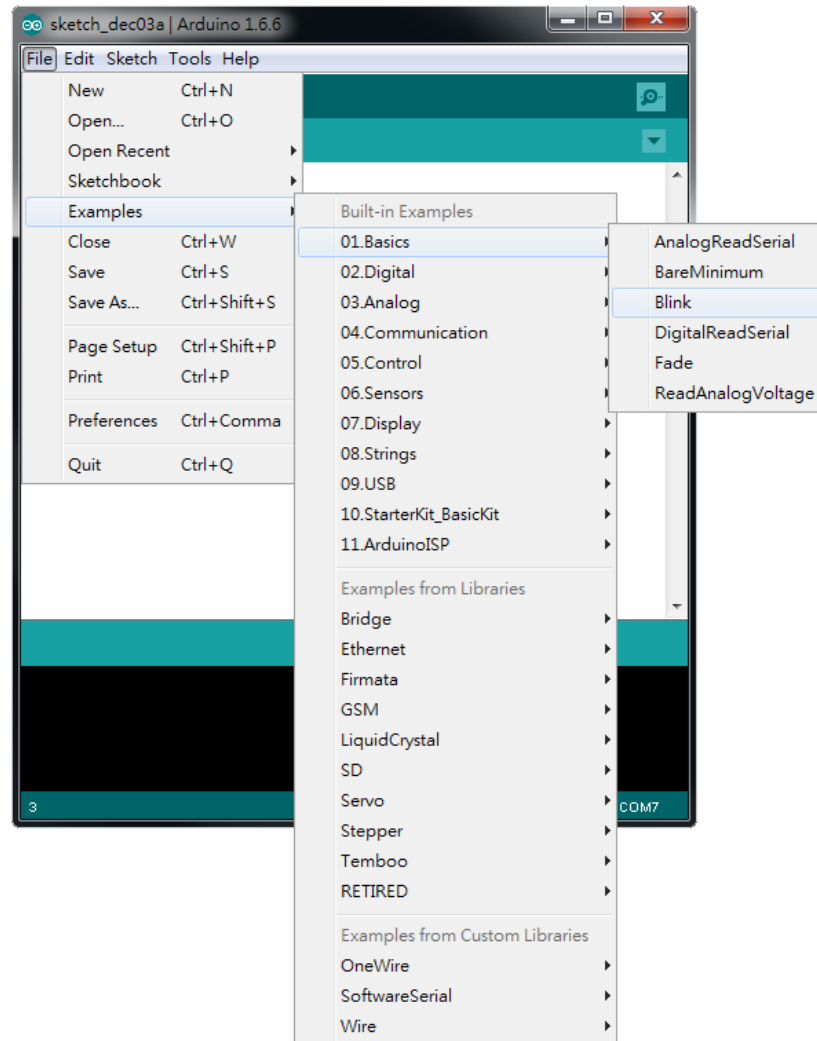
這樣開發環境就設定完成了。

Try the First Example

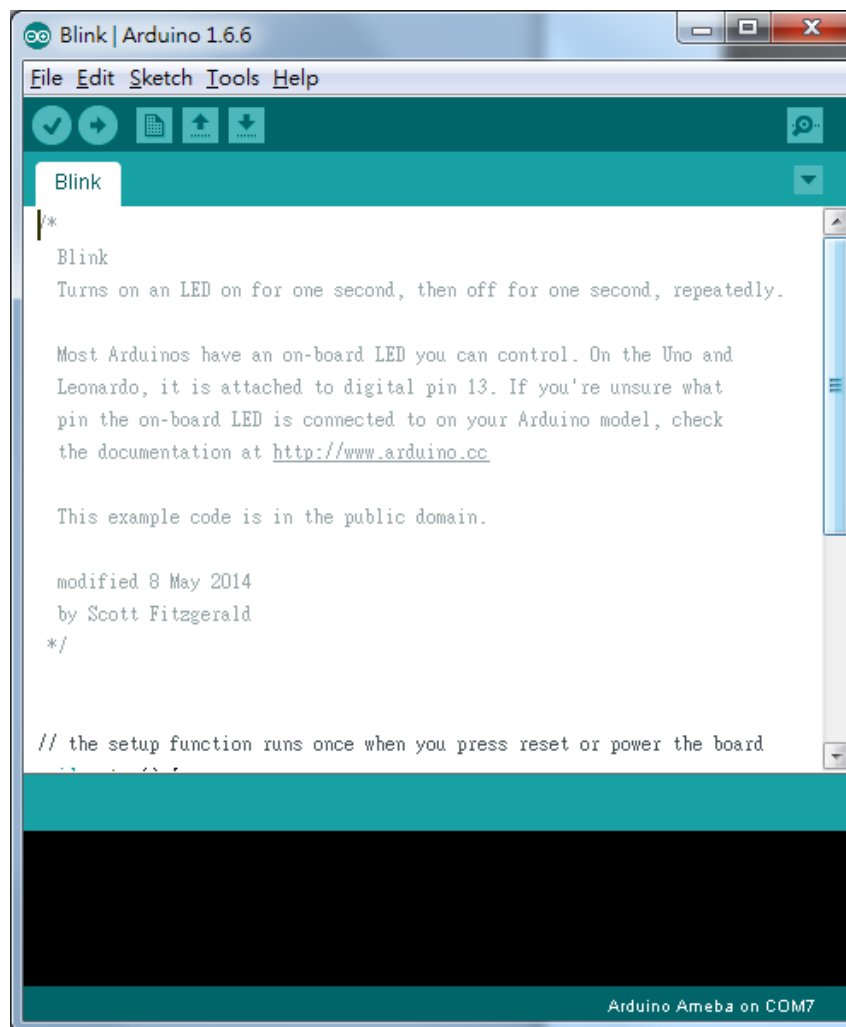
Step 1. 編譯並上傳

Arduino IDE提供許多內建的範例，這些範例只要打開經過編譯上傳之後就可以在板子上執行。我們先嘗試Blink 範例。

打開 "File" -> "Examples" -> "01.Basics" -> "Blink"



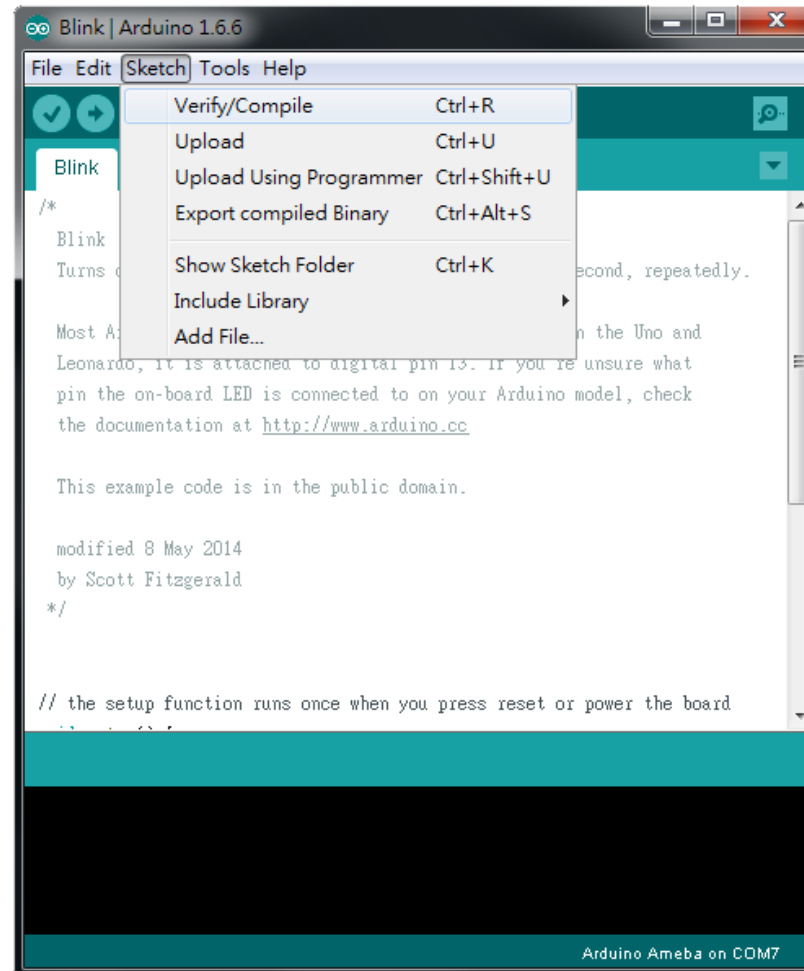
選了 Blink 之後，Arduino IDE 會打開另一個視窗，裡面已經有寫好的程式碼。



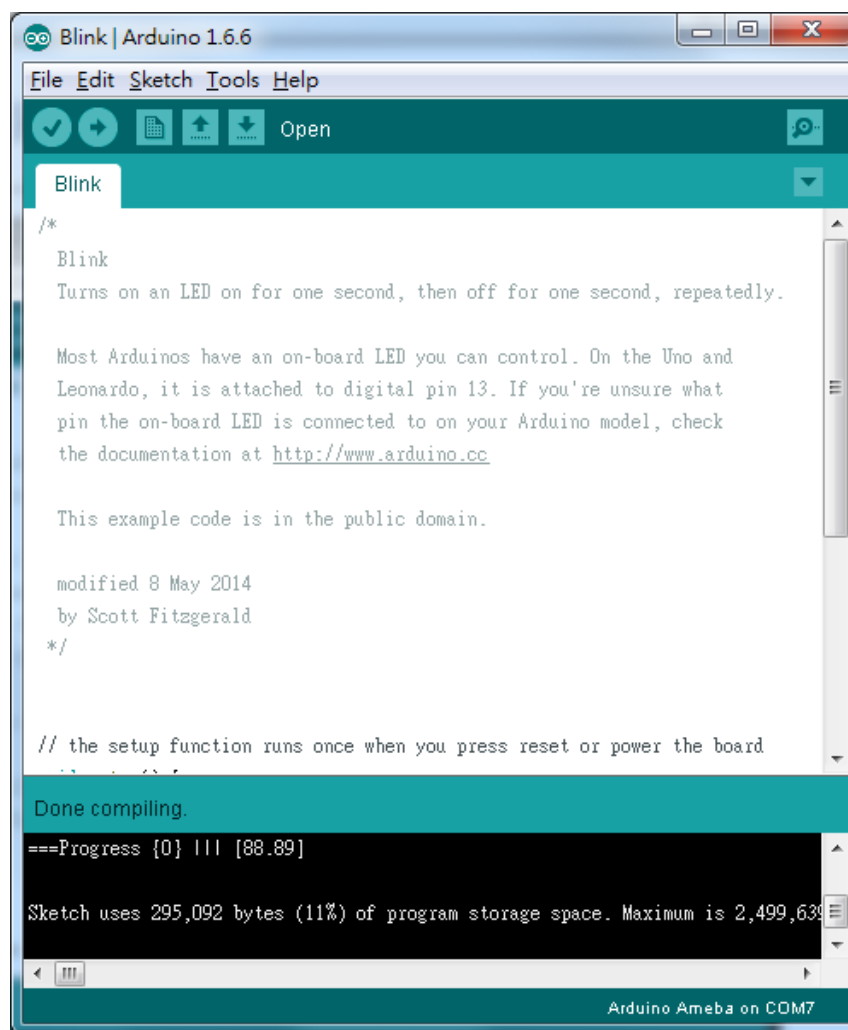
```
/*  
Blink  
Turns on an LED on for one second, then off for one second, repeatedly.  
  
Most Arduinos have an on-board LED you can control. On the Uno and  
Leonardo, it is attached to digital pin 13. If you're unsure what  
pin the on-board LED is connected to on your Arduino model, check  
the documentation at http://www.arduino.cc  
  
This example code is in the public domain.  
  
modified 8 May 2014  
by Scott Fitzgerald  
*/  
  
// the setup function runs once when you press reset or power the board  
void setup()  
{  
  // initialize digital pin 13 as an output.  
  pinMode(13, OUTPUT);  
}
```

Arduino Ameba on COM7

我們直接編譯這份程式碼，點選 “Sketch” ->
“Verify/Compile”



接著會看到 Arduino IDE 下方的訊息列出現一些訊息，代表它正在編譯。編譯完成之後，會看到類似底下的訊息。（沒有紅色訊息就代表沒問題）



The screenshot shows the Arduino IDE window titled "Blink | Arduino 1.6.6". The menu bar includes "File", "Edit", "Sketch", "Tools", and "Help". Below the menu bar is a toolbar with icons for "Check", "Run", "Upload", "Download", and "Open". The main editor area displays the "Blink" sketch, which is a C++ program for controlling an LED. The code includes a multi-line comment describing the sketch's purpose and author information, followed by the start of the setup function. At the bottom of the IDE, a status bar shows "Arduino Ameba on COM7".

```
/*
  Blink
  Turns on an LED on for one second, then off for one second, repeatedly.

  Most Arduinos have an on-board LED you can control. On the Uno and
  Leonardo, it is attached to digital pin 13. If you're unsure what
  pin the on-board LED is connected to on your Arduino model, check
  the documentation at http://www.arduino.cc

  This example code is in the public domain.

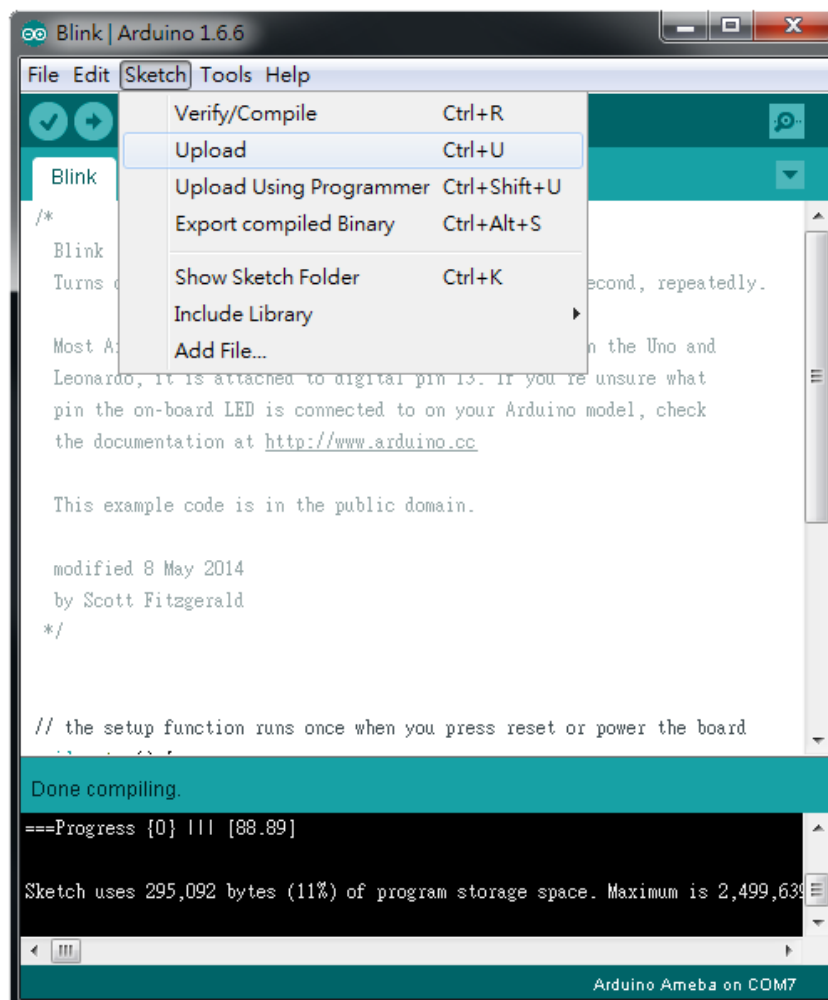
  modified 8 May 2014
  by Scott Fitzgerald
  */

// the setup function runs once when you press reset or power the board
// ...

Done compiling.
===Progress {0} ||| [88.89]

Sketch uses 295,092 bytes (11%) of program storage space. Maximum is 2,499,638.
```

接著我們就可以上傳編譯好的程式碼到Ameba上面。
先確定Ameba跟電腦之間的線有接上，然後點選
“Sketch” -> “Upload”



接著訊息欄又開始印出一些訊息，這個步驟要等比較久一點，大約要等數十秒到一分鐘，完成之後在訊息欄會看到“upload finish”的訊息就代表上傳完成。



The screenshot shows the Arduino IDE window titled "Blink | Arduino 1.6.6". The menu bar includes "File", "Edit", "Sketch", "Tools", and "Help". The toolbar contains icons for checking, running, uploading, and downloading. The sketch editor displays the following code:

```
/*  
  Blink  
  Turns on an LED on for one second, then off for one second, repeatedly.  
  
  Most Arduinos have an on-board LED you can control. On the Uno and  
  Leonardo, it is attached to digital pin 13. If you're unsure what  
  pin the on-board LED is connected to on your Arduino model, check  
  the documentation at http://www.arduino.cc  
  
  This example code is in the public domain.  
  
  modified 8 May 2014  
  by Scott Fitzgerald  
*/  
  
// the setup function runs once when you press reset or power the board  
void setup() {  
  // initialize digital pin 13 as an output.  
  pinMode(13, OUTPUT);  
}  
  
// the loop function runs over and over again forever  
void loop() {  
  digitalWrite(13, HIGH);   // turn the LED on (HIGH is the positive voltage)  
  delay(1000);              // wait for a second  
  digitalWrite(13, LOW);    // turn the LED off by making the pin LOW (no voltage)  
  delay(1000);              // wait for a second  
}
```

The serial monitor at the bottom shows the output:

```
Done uploading.  
copy C:\Users\william_lai\AppData\Local\Arduino15\packages\realtek\tools\ameba  
複製了 1 個檔案。  
upload finish
```

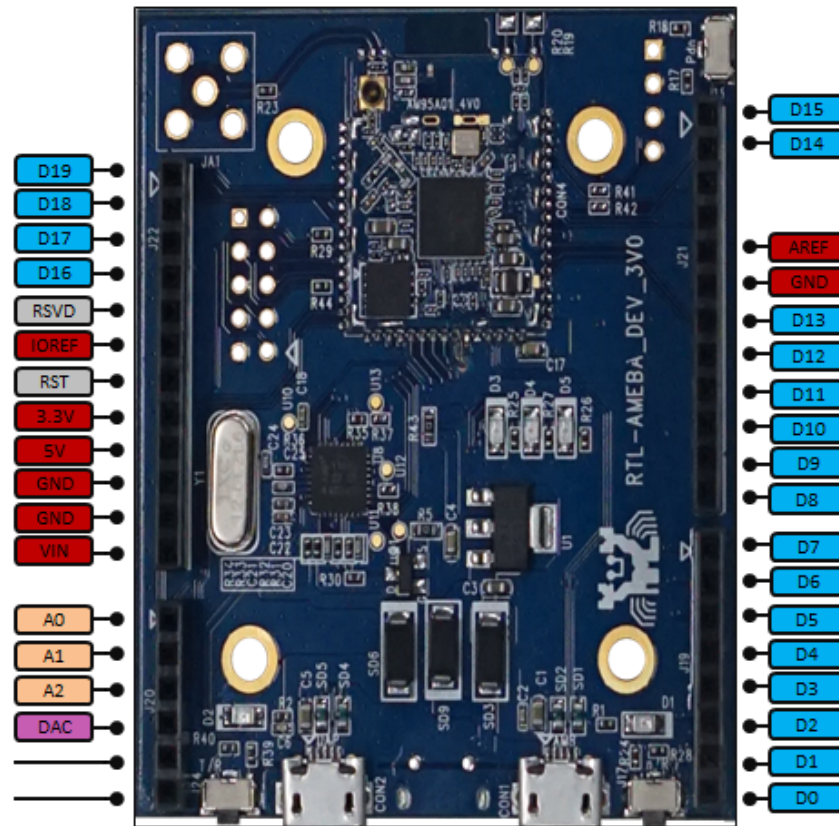
The status bar at the bottom right indicates "Arduino Ameba on COM7".

Step 2. 測試 Blink 範例

Arduino 不只提供許多範例，也提供每個範例的說明文件，包括如何接線，程式碼的說明，技術內容等等.....。這些範例不只是可以在Arduino的板子上使用，也可以在Ameba上面使用。所以我們可以在Arduino 網站上找到 Blink 的相關說明：

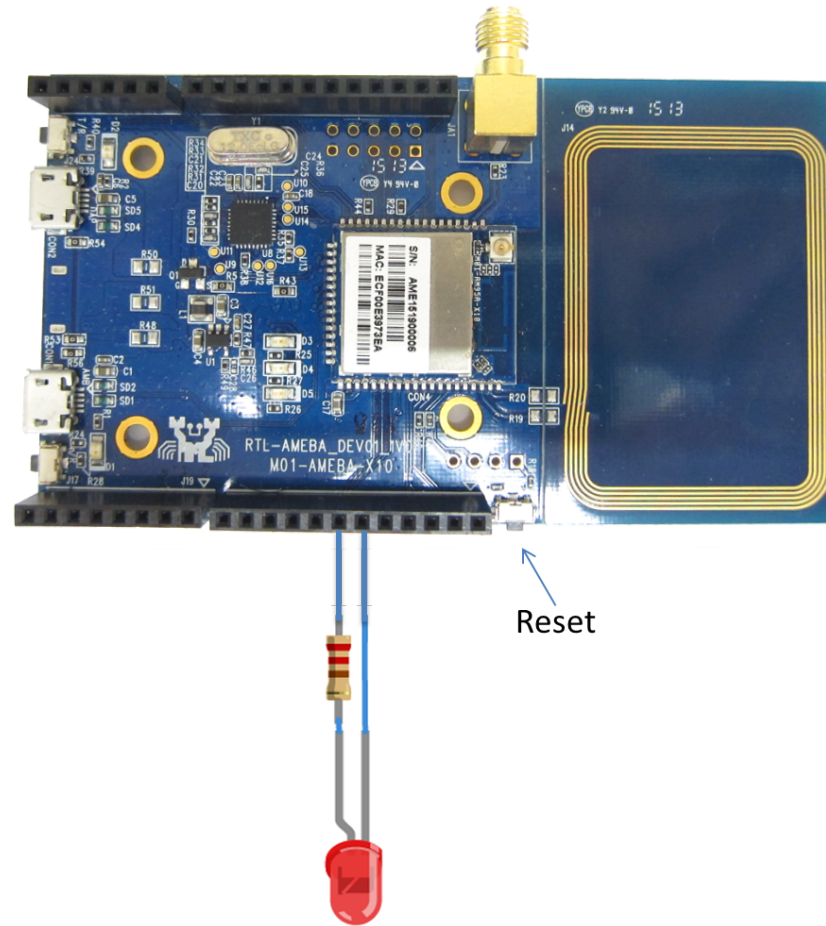
<https://www.arduino.cc/en/Tutorial/Blink>

簡單來說，Blink 這個讓 LED 燈泡閃爍，它使用的GPIO接腳是13
Ameba的Pin一樣在D13的位置，根據Ameba的接腳位置圖：



於是我們將電阻以及LED燈泡連接如下圖：

（NOTE：LED裡，長腳的是正極，接到D13的地方，短腳的是負極，接到GND的地方）



然後按一下Reset按鈕，就可以看到燈炮在閃爍，這個實驗就完成了。

如果以上過程遇到問題，請參考 [Trouble-shooting](#) 看是否能解決。

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